Journal of Advanced Zoology

*ISSN: 0253-7214*
*Volume **45** Issue **01 Year 2024** Page **33:41***

# Fieldfare (*Turdus Pilaris L.*) Nesting Ecology in the City of Stepanakert of the Republic of Artsakh and its Surrounding Territories

**Lusine Garnik Aydinyan[1*], Vahram Torik Hayrapetyan[2]**

*[1]Assistant, Shushi University of Technology,*
*[2]Doctor of Biological Sciences, Professor, Artsakh State University*
*Email: vahram76@mail.ru*

**Corresponding author's E-mail: luskarapetian@gmail.com*

***Article History***

Received: 17 June 2023
Revised: 15 Sept 2023
Accepted: 22 Sept 2023



***Abstract***

*The present study delves into the nesting ecology of fieldfares within the avian population of Stepanakert, located in the Republic of Artsakh, alongside its contiguous regions. The research material encompasses observations and investigations carried out between 2017 and 2022 within the aforementioned geographic domains. In our specific conditions, the initiation of the fieldfare nesting process transpires under outdoor air temperatures exceeding +8°C to +10°C, while the first appearance of an egg within the nest during spring corresponds to temperatures of +15°C to +16°C. The nesting substrates encompass an array of broad-leaved and coniferous trees, in addition to various man-made structures. Nest placement exhibits diversity, situated at elevations of 0.5-1.2 meters above the ground within open areas proximate to the city, escalating to 3-4.5 meters within the central zones of Stepanakert, and subsiding to 1.5-2.5 meters in woodland environs adjacent to the city. The construction of nests unfolds over a median period of 5-7 days. On average, nests accommodate a clutch of 3-5 eggs. The morphological attributes of eggs reveal considerable variability. In our contextual setting, fieldfares engender two generations annually, with an incubation duration spanning 12-13 days. Hatchlings emerge from eggs within a single day, occasionally within two days, eventually taking their inaugural flights after 15-17 days. The percentages of losses occurring between the embryonic stage and the attainment of flying capability among chicks display distinct variations.*

**Keywords:** *Nest, Avifauna, Research, Relief, Stepanakert, Fieldfare*

## 1. Introduction

Preserving urban and suburban avifauna, particularly in the face of the current alarming ecological state, stands as a paramount challenge within contemporary zoology (Hayrapetyan, Aydinyan, 2022a). To ensure the stability and dynamic equilibrium of species populations, a key imperative entail investigating their reproductive characteristics, intensity, and the safeguarding of nesting habitats. The intrinsic variability and instability inherent to urbanized environments serves as a constraining factor for all avian inhabitants within the same territories (Grishanov G., Shukshina M., 2015).

The city of Stepanakert and its adjacent regions have undergone transformation due to the repercussions of the 44-day war instigated by Azerbaijani aggressors and subsequent post-war urban development. These processes have led to a significant alteration of the once-favorable natural landscapes that supported the growth and development of the local bird populace. Consequently, a convergence of species composition has arisen, coupled with a reduction in nesting pairs. The preeminence of bird species adept at adapting to urban environments has become pronounced (Kostyushin, 1986; Ryazanov, 1984). The wide distribution of the fieldfare, serving as an exemplary paradigm, contributes substantively to the exploration of avian adaptation to urban landscapes (Voronin, 1975; Drozdov, 1967; Kislenko, 1965).

Both within the areas under discussion and across the ornithofauna of the Republic of Artsakh, fieldfares (Turdus pilaris) hold the status of a widely distributed and prevalent species. In certain instances, they even assume dominance within habitats (Baranov, Voronina, 2013). Distinguished by their marked ecological adaptability, fieldfares are known to nest even within the bustling urban precincts (Paevskii, 2010). Despite the heightened ecological flexibility exhibited by fieldfares, their presence within the

ornithofauna of Artsakh is prominent. However, there exists an absence of comprehensive data concerning their ecology, biology, and spatial distribution. Ornithological research has been notably scarce in Artsakh over recent years. Although numerous ornithological investigations have been conducted across the broader South Caucasus region (Menetries, 1832; Bogdanov, 1879; Dal, 1954; Manucharyan, 1964; Hayrumyan, 1965; Adamyan, 1962; Geilikman, 1960; 1966; Margaryan, 1975), references to Artsakh are either sparse or overlooked. In this context, the presented study holds profound relevance and exudes scientific and theoretical significance in contributing to the comprehensive documentation of Artsakh's lawful avifauna.

**The Purpose of The Work** is to study and represent the nesting ecology of fieldfare in the city of Stepanakert and its surrounding areas. Find out nesting features, reproduction dates, nest placement heights, nest sizes, number of eggs in a nest, the size of eggs.

**The Object of The Study** is the fieldfare (Turdus pilaris), the subject is the nesting ecology of the fieldfare in the city of Stepanakert and adjacent territories.

## 2. Materials And Methods

The data encompassing the nesting behaviors of the fieldfare between the years 2017 and 2022 was utilized as the foundational dataset for this scholarly investigation. The collection of this dataset took place within various locales, including groves, gardens, parks, suburban areas, and burial sites situated in the vicinity of Stepanakert. The observation period commenced in the latter part of March and extended through mid-June. Regular observations, specifically on a weekly interval, were conducted to monitor the nest conditions.

For instances where nests were situated in remote or inaccessible locations, hindering direct observation of nest content, comprehensive records were maintained detailing the specific habitat, tree or shrub species hosting the nest, and the approximate elevation relative to the ground. The process of nest observation was initiated in the initial half of March and persisted until the latter part of June. Over the course of the research endeavor, a total of 90 excursions were undertaken, each traversing a distance of 8 kilometers, culminating in an aggregate route length of 720 kilometers (refer to Figure 1). The quantification of route distances was accomplished utilizing the Easy Fit pedometer application on a mobile device. These routes were strategically chosen based upon considerations of the topography and geographical features (as depicted in Figure 2).

Upon successful identification of a nest, meticulous measurement procedures were enacted, incorporating electronic navigational equipment such as the GPSmap62stc to ascertain the precise elevation of the terrain.

Nest structures were meticulously measured using either measuring tapes or rulers, ensuring a precision of 50 millimeters, as stipulated by Mikheev (1996). The measurements undertaken encompassed several key parameters, including the overall diameter of the nest denoted as 'D,' the diameter of the cup interior (reflecting the space between the inner walls of the nest) designated as 'd,' the height of the entire nest denoted as 'H,' and the depth of the cup indicated as 'h.' Furthermore, the dimensions of the eggs were assessed using a caliper, achieving the accuracy of 0.1 millimeters.

A rigorous record-keeping regimen was initiated for eggs within nests, commencing from the inception of the first egg's appearance and persisting consistently into the future. Throughout this temporal span, a total of 246 active nests were identified within the vicinity of Stepanakert and its environs.

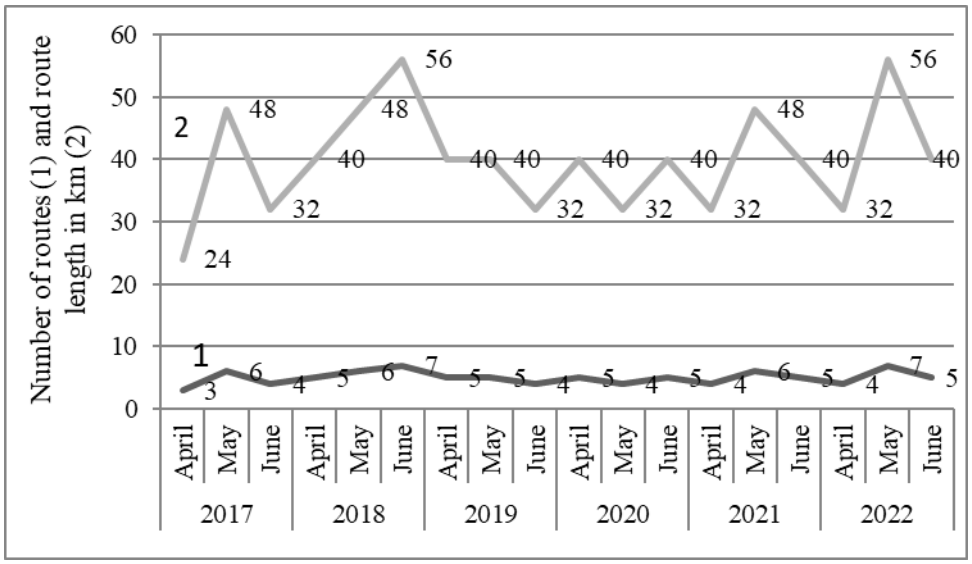


**Fig.1** The number of routes in 2017-2022 (1) and the length of the routes in km (2)

Modern landscaping of Stepanakert includes parks, squares, boulevards and natural green landscapes - forest parks and urban forests. Among the main types of trees in the parks and gardens of Stepanakert are linden, platan, maple, oak, honeysuckle, pine, cypress, thuja, etc., there are also various types of fruit trees, as well as willows and poplars. In suburban areas, in addition to the named tree species, there are also shrubs of hawthorn, juniper, Christ's Thorn, blackberry bushes, etc. (Hayrapetyan, Aydinyan, 2022b).


**Fig. 2** Route scheme

In order not to disturb the chicks too much during the feeding period, the nests were checked every 2-3 days.

### 3. Results and Discussion

In our specific environmental context, the fieldfare species displays a notable propensity for nesting across a diverse array of substrates. Predominantly, trees, shrubs, stumps, and occasionally assorted structures serve as the primary nesting substrates. Drawing from our comprehensive observations within the Stepanakert vicinity and its periphery, the nesting phase for the fieldfare initiates during the second decade of March. This temporal interval is characterized by active site selection for nesting purposes, a process that extends until the culmination of March and the midpoint of April. It is important to underline that this nesting activity is intrinsically linked to prevailing climatic conditions, particularly the ambient temperature.

The elongated nesting period exhibited by the fieldfare species can be attributed as a contributing factor to this phenomenon. Through meticulous observations spanning the years 2017 to 2022, a discernible pattern emerges whereby fieldfares commence their nest construction endeavors when outdoor temperatures range between +8°C to +10°C and beyond. Subsequently, as spring unfolds, the inaugural egg becomes evident within the nest when the ambient temperature reaches approximately +15°C to +16°C, typically occurring in the initial half of April.

Furthermore, our observations underscore that the fieldfare exhibits a preference for both deciduous and coniferous trees and shrubs as nesting sites. The spatial distribution of the 246 nests that were subject to our scrutiny is meticulously detailed in Table 1.

**Table 1** Distribution of fieldfare nests (%)

| Nest locations | In downtown | | | | | | Suburbs | | | | Suburban | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | grove | | park | | plantations | | garden | | cemetery | | forest glades | | forests | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Broad-leaved trees | 17 | 17,5 | 13 | 13,4 | 8 | 8,2 | 15 | 15,5 | 9 | 9,3 | 16 | 16,5 | 19 | 19,6 |
| Coniferous trees | 13 | 28,9 | 11 | 24,4 | - | - | - | - | 14 | 31,1 | - | - | 7 | 15,6 |
| Broad-leaved shrubs | 9 | 15,8 | 6 | 10,5 | 4 | 7 | 12 | 21 | 14 | 24,6 | 5 | 8,8 | 7 | 12,3 |
| Coniferous shrubs | - | - | 4 | 12,5 | - | - | - | - | 15 | 46,9 | 9 | 28,1 | 4 | 12,5 |
| Buildings | - | - | - | - | - | - | 5 | 33,3 | 4 | 26,7 | - | - | 6 | 40 |
| Total | 39 | 15,8 | 34 | 13,8 | 12 | 4,9 | 32 | 13 | 56 | 22,8 | 30 | 12,2 | 43 | 17,5 |

The discernible trend arising from the data presented in Table 1 unmistakably illustrates that the preponderance of nests is prominently situated upon broad-leaved trees and shrubs, collectively constituting approximately 62.6% of the nests under investigation. Concomitantly, nests located upon coniferous trees and shrubs account for 31.3% of the distribution, while those sited within structures represent 6.1%. These structures encompass abandoned huts within garden and woodland settings, as well as disused coverings within cemeteries, all of which serve as nesting sites. Within groves and parks, the principal nesting trees encompass linden, ash, platan, willow, oak, pine, cypress, and spruce. Conversely, plantings are predominantly characterized by nests upon honeysuckle and lilac shrubbery. Orchards within gardens accommodate nesting upon fruit-bearing trees, nut-bearing trees, grape vines, as well as currant and gooseberry bushes. Cemeteries exhibit a predilection for nesting within lilac and rose bushes. Forest glades are characterized by the utilization of junipers, rose-hip bushes, honeysuckle, Christ's Thorn, and blackberry bushes as nesting locales. Notably, an array of tree species is employed for nesting within forested environments.

The research endeavor also facilitated the determination of nest elevations above ground level, which is detailed in Table 2. The altitudes at which the nests of fieldfares are positioned exhibit a reliance on the specific nesting locations. Consequently, the variation in elevation ranges from 0.5 to 1.2 meters above ground within open spaces proximate to the city environs, extends to 3-4.5 meters in central sectors of Stepanakert, and ranges from 1.5 to 2.5 meters within the forests adjacent to the city.

**Table 2** Heights of nest locations in meters in the city of Stepanakert and its suburban areas

| Nest detection places | Number of nests | Min-max | M | δ | m | Cv% |
|---|---|---|---|---|---|---|
| Peripheral glades and sidewalks | 67 | 0,5-1,2 | 0,94 | 0.25 | 0,03 | 26,6 |
| Suburban forests and groves | 136 | 1,5-2,5 | 2,1 | 0,38 | 0,03 | 18,1 |
| Parks and boulevards | 43 | 3-4,5 | 3,6 | 0,52 | 0,08 | 14,4 |

***Note. n – The number of nests, Min - minimum value, Max - maximum value, M - the arithmetic mean, δ - the mean square deviation, m - error of the arithmetic mean, Cv - coefficient of variation.***

In our assessment, the comparatively lower positioning of nests in open spaces and sidewalks in close proximity to the city (at an elevation of 785 meters above sea level) can be attributed to the absence of disruptive factors and the dearth of towering trees. Within this specific locale, we documented a total of 67 nests, positioned at an average elevation of 0.94 meters. Similarly, the average elevation of nests across suburban forests (at an elevation of 880 meters above sea level), cemeteries, and gardens stands at 2.1 meters, as depicted in Table 2. This area, akin to the open spaces, experiences minimal disturbances. Contrarily, within the central district of Stepanakert, encompassing parks and boulevards, the average elevation of 43 nests amounts to 3.6 meters. The elevated positioning of nests in this region

can be directly linked to heightened levels of disturbance. Such a nesting pattern enables fieldfares to situate their nests within the crevices of broad-leaved trees during the early spring, prior to the emergence of leaves that would otherwise conceal the nests.

Our investigation reveals a diverse selection of 19 tree and shrub species, along with various structures, serving as nesting substrates (refer to Table 3). Among the 246 nests we cataloged, 27 nests (constituting 10.9%) were identified in boulevards, 25 nests (representing 10.3%) within parks, 18 nests (accounting for 7.3%) within plantings, 30 nests (making up 12.2%) within gardens, 47 nests (equating to 19.1%) within cemeteries, 44 nests (comprising 17.8%) within forest glades, and finally, 55 nests (forming 22.4%) within forests. Evidently, our observations underline a preference for densely vegetated deciduous shrubs and trees by fieldfares. This inclination is manifest through the preponderance of nests within nut-bearing trees and lilac shrubs, constituting 5.3% and 4.2% of the total nests, respectively, within the shrub category. Amongst broad-leaved climbing trees, oak (8.9%) and linden (7.3%) are favored, while pine (7.3%) garners preference among conifers. We posit that the predilection for deciduous trees as nesting sites is influenced by the enhanced nest protection they offer.

**Table 3** Trees, shrubs, and structures used by fieldfare for nesting

| Types of trees and shrubs | Nesting sites | | | | | | | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | park | | boulevard | | planting | | garden | | cemetery | | forest glade | | forest | | | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Linden tree -Tilia | 6 | 33,3 | 3 | 16,7 | - | - | - | - | 2 | 11,1 | - | - | 7 | 38,9 | 18 | 7,3 |
| Oak - Quércus | 3 | 13,6 | 4 | 18,2 | - | - | - | - | 5 | 22,7 | 4 | 18,2 | 6 | 27,3 | 22 | 8,9 |
| Maple -Acer | 2 | 14,3 | - | - | 2 | 14,3 | | | 2 | 14,3 | 3 | 21,4 | 5 | 35,7 | 14 | 5,7 |
| Platan-Platanus | - | - | 3 | 21,4 | - | - | - | - | 2 | 14,3 | 3 | 21,4 | 6 | 42,9 | 14 | 5,7 |
| Willow-Salix | 2 | 14,3 | 4 | 28,6 | 3 | 21,4 | - | - | 4 | 28,6 | 1 | 7,1 | - | - | 14 | 5,7 |
| Poplar -Populus | 4 | 36,4 | 2 | 18,2 | - | - | - | - | 3 | 27,2 | - | - | 2 | 18.2 | 11 | 4,5 |
| Plum tree-Prunus | - | - | - | - | - | - | 10 | 66,6 | 1 | 6,7 | 3 | 20 | 1 | 6,7 | 14 | 5,7 |
| Apple tree-Malus | - | - | - | - | - | - | 6 | 60 | 1 | 10 | 3 | 30 | - | - | 10 | 4,2 |
| Pear tree -Pyrus | - | - | - | - | - | - | 5 | 45,4 | 2 | 18,2 | 2 | 18,2 | 2 | 18,2 | 11 | 4,5 |
| Cypress-Cupressus | 3 | 20 | 2 | 13,3 | 3 | 20 | - | - | 3 | 20 | - | - | 4 | 26,7 | 15 | 6,1 |
| Pine-Pinus | 2 | 11,1 | 3 | 16,7 | 4 | 22,2 | - | - | 5 | 27,8 | 4 | 22,2 | - | - | 18 | 7,3 |
| Hawthorn-Crataegus | - | - | - | - | - | - | - | - | 4 | 36,4 | 1 | 9,1 | 6 | 54,5 | 11 | 4,5 |
| Nut-tree-Corylus | - | - | - | - | - | - | 5 | 38,5 | - | - | 3 | 23 | 5 | 38,5 | 13 | 5,3 |
| Honeysuckle-Lonicera | - | - | - | - | 2 | 22,2 | - | - | 3 | 33,3 | 4 | 44,5 | - | - | 9 | 3,7 |
| Lilac-Syringa | 3 | 30 | 2 | 20 | 4 | 40 | - | - | 1 | 10 | - | - | - | - | 10 | 4,2 |
| Christ's Thorn - Paliurus spina | - | - | - | - | - | - | - | - | - | - | 4 | 100 | - | - | 4 | 1,6 |
| Blackberry-Rubus caesius | - | - | - | - | - | - | - | - | 1 | 20 | 4 | 80 | - | - | 5 | 2 |
| Juniper -Juniperus | - | - | - | - | - | - | - | - | 3 | 37,5 | 5 | 62,5 | - | - | 8 | 3,3 |
| Blackthorn - Prunusspinosa | 2 | 22,2 | 2 | 22,2 | - | - | - | - | - | - | - | - | 5 | 55,6 | 9 | 3,7 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Buildings | - | - | - | - | - | - | 4 | 26,7 | 5 | 33,3 | - | - | 6 | 40 | 15 | 6,1 |
| Total | 27 | 10,9 | 25 | 10,3 | 18 | 7,3 | 30 | 12,2 | 47 | 19,1 | 44 | 17,8 | 55 | 22,4 | 246 | 100 |

Similar to other thrush species, the nuances of nest construction in fieldfares are contingent upon several factors encompassing the security of the chosen nesting site, the architectural attributes of the site, plant height, as well as the availability and reliability of materials for nest fabrication. Our observational inquiry revealed that the fieldfare predominantly selects the branches of deciduous trees as its nesting substrate, showing a marked preference for sunlit and open locations. Notably, only a minor proportion of nests, accounting for 6.1% or 15 instances out of a total of 246 nests documented over the observed duration, were situated within artificial structures.

The dimensions of the nests exhibit a notable degree of variability, as delineated in Table 4. The observed fluctuations in nest sizes are plausibly attributed to the extent of nest preservation and the diverse materials employed in the construction process.

**Table 4** The dimensions of the nests of the fieldfare

| Nesting place | | Number of nests | Nest diameter | | Cup diameter | | Nest height | | Nest depth | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min-max | M | Min-max | M | Min-max | M | Min-max | M |
| 1 | Park | 27 | 124-135 | 133 | 101-123 | 113 | 98-110 | 101 | 70-82 | 74 |
| 2 | Boulevard | 25 | 127-139 | 135 | 107-124 | 116 | 101-112 | 108 | 71-84 | 75 |
| 3 | Plantings | 18 | 122-136 | 130 | 104-121 | 110 | 100-113 | 105 | 73-86 | 73 |
| 4 | Garden | 30 | 125-141 | 139 | 110-129 | 119 | 107-119 | 112 | 75-94 | 85 |
| 5 | Cemetery | 47 | 121-134 | 132 | 100-119 | 105 | 106-115 | 111 | 78-99 | 87 |
| 6 | Forest glade | 44 | 123-140 | 136 | 111-131 | 120 | 110-124 | 118 | 80-88 | 81 |
| 7 | Forest | 55 | 128-145 | 140 | 112-132 | 122 | 109-127 | 122 | 82-98 | 88 |

***Note: Min is the minimum value, Max is the maximum value, M is the arithmetic mean.***

Various herbs and leaves are employed in the construction of fieldfare nests, while slender branches sourced from trees and shrubs form the foundational framework. Characterized by a dual-layered structure, the interior of the nest is adorned with a cushioning layer. Nests are predominantly assembled by the female members of the species, although instances of male participation in the final stages of nest construction can occur in individual pairs. The temporal aspect of nest construction exhibits variability, likely influenced by the female's experience and prevailing climatic conditions. Notably, our observations indicate a cessation of nest construction during periods of rainfall.

Within the majority of instances under observation, nest construction is completed within 4 days (8 cases), occasionally within 6 days (3 cases), and on a few occasions within 7 days (2 cases), yielding an average range of 5-7 days. The male fieldfares predominantly fulfill a protective role during nest construction, securing the nest sites through their vocalizations. Over the course of the nesting season, the fieldfares exhibit an augmentation in their plumage coloration, achieving heightened vibrancy. Nesting primarily takes place in pairs, occasionally forming colonies consisting of 8-10 to 15-20 individuals, occupying territories of approximately 1-1.5 hectares.

Remarkably, egg laying ensues promptly upon nest completion. In specific instances, eggs are laid on the subsequent day (12 cases), occasionally after a two-day interval (7 cases), and in isolated cases, we recorded instances where egg laying occurred immediately after nest completion (2 cases). Intriguingly, we did not document any instances of nest repair or reuse by fieldfares throughout our observations. Even in cases where the same nesting site is revisited, a new nest is consistently constructed.

Within the avian population of Artsakh, fieldfares exhibit a biannual reproductive cycle, spawning in both spring, which initiates during the first and second halves of April, and in late May or early June. The incubation period extends for 12-13 days. Our observations reveal that the culmination of spawning results in 3-6 eggs within fieldfare nests. It's noteworthy that the mean number of eggs within nests exhibits interannual variability, as indicated in Table 5.

**Table 5** Study of nests by years and the number of eggs in the nests

| Nest detection sites | 2017 | | 2018 | | 2019 | | 2020 | | 2021 | | 2022 | | Average number of eggs in nests / nest |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of nests/eggs | Total eggs | Number of nests/eggs | Total eggs | Number of nests/eggs | Total eggs | Number of nests/eggs | Total eggs | Number of nests/eggs | Total eggs | Number of nests/eggs | Total eggs | |
| Park | 8/6 | 48 | 5/5 | 25 | 5/3 | 15 | 4/6 | 24 | - | - | 3/4 | 12 | 25/4,9 |
| Boulevard | 5/4 | 20 | 3/5 | 15 | 4/3 | 12 | 3/5 | 15 | 4/4 | 16 | - | - | 19/4,1 |
| Plantings | 3/3 | 9 | 4/6 | 24 | 3/4 | 12 | - | - | 2/4 | 8 | 2/4 | 8 | 14/4,3 |
| Garden | 11/5 | 55 | 33/6 | 198 | 9/4 | 36 | 3/6 | 18 | - | - | 4/5 | 20 | 60/5,4 |
| Cemetery | 7/6 | 42 | 6/4 | 24 | 7/5 | 35 | 2/5 | 10 | 2/6 | 12 | - | - | 24/5,1 |
| Forest glade | 15/4 | 60 | 4/4 | 16 | 9/5 | 45 | 4/5 | 20 | 6/6 | 36 | 6/5 | 30 | 44/4,7 |
| Forest | 16/5 | 80 | 25/5 | 125 | 7/6 | 42 | 7/5 | 35 | 3/3 | 9 | 2/4 | 8 | 60/4,9 |
| Total | 65/4,8 | 314 | 80/5,3 | 427 | 44/4,5 | 197 | 23/5,3 | 122 | 17/4,8 | 81 | 17/4,6 | 78 | 246/4,9 |

***Acquaintance: the numerator is the number of nests, the denominator is the number of eggs***

The spring breeding period exhibits the maximum count of eggs per nest (5-6 eggs), whereas summer breeding tends to result in fewer eggs (3-4 eggs). Our research encompassed 15 nests containing 3 eggs, 55 nests with 4 eggs, 102 nests containing 5 eggs, and 74 nests with 6 eggs. Across the entirety of our study, the calculated average egg count in nests ranged from 4.5 to 5.3 eggs across distinct years, and from 4.1 to 5.4 eggs in accordance with distinct nesting sites. Our findings indicate that gardens and cemeteries yielded a relatively elevated count of eggs per nest, with averages of 5.4 and 5.1, respectively. Parks and forests exhibited a slightly lower average of 4.9, while boulevards demonstrated the smallest average egg count at 4.1, as illustrated in Table 5.

The quantity of eggs, as established by the literature (Paevsky, 1985) and corroborated by our gathered data, is primarily influenced by a consistent food supply, climatic conditions, and the population density within a particular region. We posit that the reduced number of eggs during the second nesting phase could be attributed to food availability, given that fieldfares predominantly nourish their fledglings with larvae.

While our observations encompassed a total of 246 nests within the study period, equating to a count of 1219 eggs, we opted to conduct measurements on only 224 eggs to uphold ecological equilibrium within the studied area and minimize undue disturbance to the avian population. These measurements are presented in Table 6. The data depicted in Table 6 underscores significant variations in egg dimensions. Heightened variability is evident in egg lengths within park, planting, and forest settings, characterized by coefficients of variation of 13.3%, 10.5%, and 10.9%, respectively. Comparatively, gardens and cemeteries exhibit a moderate level of variability. Conversely, park and forest glade settings exhibit lower coefficients of variation. Similar variability trends are also observed in egg diameter measurements, whereas egg mass measurements demonstrate lower coefficients of variation.

**Table 6** Morphological measurements of eggs of fieldfares studied in different locations

| Research sites | n | Length (mm) | | | | | diameter (mm) | | | | | Weight (g) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Max | M | δ | Cv | Min | Max | M | δ | Cv | Min | Max | M | δ | Cv |
| park | 23 | 23,6 | 33,6 | 29,4 | 3,9 | 13,3 | 18,5 | 26,3 | 23 | 2,7 | 11,7 | 6,1 | 7,4 | 6,6 | 0,42 | 6,4 |


*Available online at: https://jazindia.com*

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| boulevard | 16 | 24,7 | 31,5 | 26,7 | 1,7 | 6,4 | 18,7 | 25,5 | 21,8 | 2,9 | 13,3 | 6 | 6,9 | 6,2 | 0,24 | 3,9 |
| plantings | 17 | 22,8 | 30,7 | 25,8 | 2,7 | 10,5 | 17,6 | 26,2 | 23,1 | 3,1 | 13,1 | 5,8 | 6,8 | 6,2 | 0,36 | 5,8 |
| garden | 55 | 26,5 | 34,7 | 30,7 | 2,4 | 7,9 | 19,3 | 27,2 | 24,9 | 2,8 | 11,2 | 6,7 | 7,3 | 6,9 | 0,2 | 2,9 |
| cemetery | 19 | 25,6 | 33,4 | 27,6 | 2,6 | 9,4 | 19,1 | 27,1 | 25,9 | 2,4 | 9,3 | 6,3 | 7,1 | 6,6 | 0,25 | 3,8 |
| forest glade | 32 | 27,3 | 33,9 | 30,2 | 1,6 | 5,3 | 19,3 | 26,7 | 24,2 | 2,4 | 9,9 | 6,5 | 7,4 | 6,8 | 0,3 | 4,4 |
| forest | 62 | 25,7 | 35,2 | 31,1 | 3,4 | 10,9 | 18,8 | 28,6 | 26 | 2,6 | 10 | 6,8 | 7,5 | 7,1 | 0,2 | 2,8 |

We posit that the variations observed in egg size can be attributed to a range of factors, including population variability, the age of females, the sequential order of eggs, maternal nutrition, the availability of a consistent food source, and other influencing variables.

Hatchlings typically emerge within a span of one, occasionally two days. According to our meticulous observations, the initiation of chick hatching is marked by calendar dates commencing on April 23rd. To illustrate, the maiden chick sighting in Stepanakert's parks occurred on April 23, 2017. In the same year, the inaugural chick sighting within the forests of suburban areas took place on April 25. During the subsequent reproductive phase, the debut of fledglings transpires in early June or the initial portion of the month. For instance, on June 6, 2018, newly hatched chicks were observed in 3 out of 5 nests surveyed within the park. Subsequently, no additional instances of newly hatched chicks were documented beyond June 12.

The initial endeavors of fledglings to unfurl their wings manifest within the initial decade of their existence, culminating in the commencement of flight capabilities between 15 to 17 days of age.

A pivotal metric for gauging the health of populations lies in successful nesting and a robust hatching index, both of which are subject to annual fluctuations. These variations are contingent upon environmental circumstances, nesting locales, and the presence of predators, often leading to instances of heightened embryonic mortality and chick demise. As an illustrative example, in 2017 within the Nor-Aresh district of Stepanakert city (at an elevation of 760 meters above sea level), on April 27, a total of 11 chicks, constituting 61.1%, successfully hatched from an initial count of 18 eggs distributed across four nests. Of these, merely 6 chicks, equating to 54.5%, attained the age of flight, culminating in an overall reproduction rate of approximately 33.3%. Similarly, within the Achapnyak district on May 4, 2019 (at an elevation of 720 meters above sea level), 39 out of 44 eggs within 13 surveyed nests hatched, reflecting an 88.6% success rate. However, only 27 fledglings, amounting to 69.2%, matured to the flying stage, resulting in an aggregate reproduction rate of around 61.4%. Conversely, within a Stepanakert Garden on April 23, 2020, a striking 17 chicks, equivalent to 94.4%, emerged from 18 eggs within 3 observed nests. These 17 chicks all successfully fledged, rendering an impeccable total reproduction rate of 94.4%.

During the second incubation period coinciding with the end of May and the commencement of June, the average reproduction coefficient assumes an elevated stance, ranging from 85% to 90%. This recurrent pattern underscores the profound influence of weather conditions on the overarching breeding success of fieldfares.

## 4. Conclusion

Based on the outcomes derived from our comprehensive investigation, it is evident that fieldfares within the city of Stepanakert and its surrounding environs exhibit traits characteristic of a widespread, ecologically adaptable, and prevalent species. An integral determinant for the commencement of their spring nesting endeavors lies in the ambient temperature, with nest construction initiated when outdoor temperatures reach or surpass +8°C to +10°C. The appearance of the first egg within the nest coincides with the attainment of temperatures around +15°C to +16°C, corresponding to early April.

Fieldfares in this locale exhibit a versatile nesting preference, utilizing 19 distinct species of trees and shrubs, as well as structures rarely frequented by humans. Nest elevation varies in accordance with nesting locales, ranging from 0.5 to 1.2 meters above ground level in open spaces proximate to the city, 3-4.5 meters within the central sectors of Stepanakert, and 1.5-2.5 meters in suburban woodland regions.

The count of eggs within nests exhibits variability, with maximal numbers of 5-6 eggs during spring breeding, and fewer eggs, typically 3-4, in summer. The factors influencing egg count encompass the age of the fieldfares, the availability and abundance of nourishment, population density, and other pertinent considerations.

Observations underscore the notable percentage of embryonic mortality and fledgling losses, attributed to climatic conditions, nesting sites, and the presence of predators.

**References:**


1. Adyamyan M.S. To the ecology of three poorly studied species of sparrow birds// Materials III Vsesoyuz. Ornithologist. Conf. 11-17 september 1962 , c.Lviv 1962.book 1. p. 6-7.
2. Ayrumyan K.A., Factors limiting the size of the clutch in chickens and the safety of their chicks//Izvest.AH ArmCCP. Biological sciences.T 18, № 11. 1965, p. 82-87.
3. Hayrapetyan V.T, Aydinyan L.G., Distribution and ecology of black thrushes (Turdus merula) in the Berkadzor community of the Republic of Artsakh // Biology of Armenia. journal, 2 (74), DOI:10.54503/0366-5119-2022.74.2-59, 2022a, p. 59-66.
4. Hayrapetyan V.T, Aydinyan L.G,Nesting ecology of black thrushes (Turdus merula, Linnaeus, 1758) in the conditions of Stepanakert city// Armenian biob. journal, 3 (74), DOI. 10.54503/0366-51192022.74.3-58, 2022b, p. 58-63.
5. Bogdanov M.N., Birds of the Caucasus //Kazan, 1879,p. 187 .
6. Baranov A.A., Birds of intrazonal forest communities of the steppe zone of Middle Siberia. monograph / A.P. Savchenko. Krasnoyarsk: 2013. p.212 .
7. Voronin A.A., Margolin V.A., To the biology of thrushes in the breeding period// Uchenye zapiski Permskogo pedinstituta. 1975. N. 146. p.109–112
8. Grishanov G.V., Shushina M.S., Urbanization of song thrush (Turdus philomelos L. Brehm) in Kaliningrad. the history of the process and the reasons for the failure// Vestnik of the Baltic Federal University. И. Canta. 2015. Issue 7. p.14-22.
9. Geylikman B.O., Description of the muscles of the lower limb and the tail of the black vulture// News AN Arm. SSR, XIII, N 12, 1960 p.85-96.
10. Geylikman B.O., To the ecology of the white-headed squirrel in the Armenian SSR// AN Arm.SSR, biological journal of Armenia, XIX, N 3, 1966; p.93-105.
11. Dal S.K., Fauna of the Armenian SSR Vertebrate Animals, AN ArmSSR, 1954, p.382.
12. Drozdov N.N., Fauna and bird population of the cultural landscape // Ornithology. 1967. Issue. 8. p.3–46.
13. Kislenko G.S., On the biology of fieldfare in the Krasnoyarsk Territory / / News of ornithology. Alma-Ata, 1965, p.159–160.
14. Kostyushin V.A., Change in the number and species composition of birds in areas with different levels of recreational load in the ripe and middle-aged oak forests of the green zone of Kiev // National Ecological Center of Ukraine. 1986. N. 3. p.48–50.
15. Manucharyan G.G., Ecology of the white-tailed warbler Sylvia mystacea Menetries in the Armenian Union of Soviet Socialist Republics // Yerevan University. Natural Sciences. Issue. 2. 1967. p.107-111
16. Margaryan N.A., Waterfowl of Armenia and measures to restore their numbers // Abstract of the thesis. Yerevan, 1975, p.23 .
17. Mikheev A.B., Biology of birds. Field guide to bird nests. M.: Citadel, 1996.p.460 .
18. Paevski V.A., Demography of birds//. Publishing house "Nauka", Leningrad, 1985. p. 265 .
19. Paevski V.A., On the population of fieldfare Turdus pilaris in the very center of St. Petersburg and on some general issues of bird urbanization // Russian Ornithological Journal. 2010. V. 19. p. 27–31.
20. Ryazanov A.G., On the issue of changing the ecology and behavior of birds in a big city // Species and its productivity in the area: materials of the 4th All-Union Conference: Part 11. Sverdlovsk, 1984. p. 87–88.
21. Menetries E.l.-Catalogue raisonne des objct de zoologie recuellis dans un voyage au Caucase et jusquaux frontiers actuelles de la perse eterepris par rder de sa majeste lemperur// Vol. 3g., 1832, p. 271.